Use of a Joint Battlefield Function Analysis to Produce Training Source Materials

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Training front-end analysis materials and self-assessment procedures developed in the earlier phases of the Joint and Multi-Service Distributed Training Testbed (JMDT2) program were compiled in the form of a resource document, here called a guidebook. This report discusses the use of a joint fire support battlefield function (BF) analysis as the resource from which staff responsibilities were extracted and detailed task descriptions developed. Training progress self-assessment procedures were also drawn from the BF analysis. The resulting materials provided bases for conducting mini after action reviews. The focus was on the staff sections responsible for joint fires operations in an Army Corps Joint Task Force exercise.

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Use of a Joint Battlefield Function Analysis
to Produce Training Source Materials

Introduction

This describes a methodology for developing training guides with training objectives and performance measurement tools based on a completed Battlefield Function analysis and demonstrates that methodology through the use of an example.

The primary source document used in our example was an analysis of Battlefield Function (BF) 15 as it is performed in a corps joint task force operation (Fields, Taylor, Moore, & Mullen, 1997). The definition of BF 15 at this echelon is: "Coordinate, synchronize, and integrate joint fires as accomplished by an Army Corps acting as a Joint Task Force." The product resulting from the use of this source document and other materials was the "Joint Fires Training Guide for a Corps JTF (Love, 1998). That training guide, a training resource document tailored for a particular set of users, describes in detail: the joint fires training objectives task and standards, the responsibilities and tasks of the key staff sections involved in joint fires operations, and the self assessment tools for measuring how well the tasks and standards are accomplished. These sections were based on and derived from the BF 15 analysis. Using other materials as inputs, the training guide also provides seven appendices containing needed additional resources. Examples include: a description of the Deep Operations Coordination Cell; abbreviations; and references. These are intended as readily-at-hand references for use by staff officers during planning for and conduct of joint fires operations.

Background on Battlefield Functions

Battlefield Function (BF) is a major subheading under a Battlefield Operating System (BOS). When analyzed it results in a collection of related tasks and linkages among tasks occurring either sequentially or in parallel that must be performed to accomplish a mission. BF analysis is a methodology based on a human engineering tool known as the *operational sequence diagram (OSD)*. BF analysis is a tool for detailing BFs at specific echelons and showing linkages to other echelons and BFs. BF analysis with its underlying techniques of operational sequence diagramming is intended to supplement or complement other task analytic approaches in support of training development and management. For example, it can be used in conjunction with Mission Training Plans (MTPs), unit Standard Operating Procedures (SOPs), or the Uniform Joint Task List (UJTL) (Joint Chiefs of Staff, 1996b). The current research summarized by this report employs BF analysis to convert UJTL data into training performance assessment measures to support after-action reviews (AARs). This report explains how to do the transition.

Research conducted by U.S. Army Research Institute (ARI) on the use of battlefield functions addresses the commander's requirement for sufficient detail to support his training needs. The functionally-based analytical technique employed by ARI facilitates a comprehensive review of all relationships contributing to achieving a defined purpose and results in information which can be applied to support training. This analytical technique was used to examine BF 15.

BF 15 analysis at the corps as a joint task force (JTF) level was built on previous analyses of BFs for a heavy battalion task force, a brigade combat team, a division, and a corps (e.g., Ford, Mullen, & Keesling, 1997). The analysis for corps was designed to supplement the Universal Joint Task List (UJTL) and the Joint Task Force Headquarters Master Training Guide (JTF HQ MTG) by providing the identification and linkage of participants, information requirements, and other data required to accomplish the UJTL task (Joint Chiefs of Staff (1996a,b). Such linkage reaches to all of the echelons involved. The information contained in the BF analysis was intended to be a source for facilitating training (e.g., development of training support packages), for enabling assessment (e.g., development of assessment packages), and for designing exercises (through its definition of tasks, participants, information requirements, and so on).

The critical combat functions and detailed tasks in BF 15 at the JTF level are linked to the following UJTL tasks:

UJTL Task OP 3.2.7 - <u>Integrate/Synchronize Operational Firepower</u>.

Purpose: The integration of operational firepower on single or multiple operational targets at the decisive time and place. This integration includes lethal and/or non-lethal attacks, to include friendly command and control warfare (C^2W) and electronic warfare (EW) measures and minimizes their effects on friendly forces, neutrals, and noncombatants.

UJTL Task TA 3.3 - <u>Integrate Tactical Fires</u>.

Purpose: The combination and coordination of all fires and nonlethal means for the tactical commander in support of the commander's concept of operations and intent, maximizing their effects in accomplishing the mission and minimizing their effect on friendly forces, neutrals, and noncombatants.

BF 15 (Coordinate, Synchronize, and Integrate Joint Fires) is similar to the UJTL tasks above:

Purpose: The coordination, synchronization, and integration of targeting assets,

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indirect fire weapons, naval surface fires, armed aircraft, electronic counter-measures, and other lethal and non-lethal means against ground targets in support of operations.

The BF 15 functional analysis reflects tasks, products, and participants required by the JTF to employ all aspects of joint fires and joint fire support available and under JTF control. It does this at an overall JTF staff level. In other words, it states what the JTF staff as a whole has to do and how it should be done. It does not, however, break that information out in sufficient detail for each of the key staff sections involved.

BF 15 analysis also contains an assessment package with measures of effectiveness and performance for use in preparing AARs at the overall JTF staff level. It does not, however, provide performance assessment measures for each of the key staff sections.

Utility of Battlefield Functions in Training Guide Development

In General

Analyzed Battlefield Functions represent a wealth of information for doctrine developers, for trainers, and for unit commanders and their staffs. The input/output charts and the linkages of tasks to doctrinal references and to the UJTL are truly outstanding, since joint doctrinal and training manuals don't display or are missing that information. But most significantly, in the absence of joint "how to" manuals, BFs analyses provide sets of comprehensive and detailed tasks (including the "how to", arranged in logical combat operational sequences for the missions and functions involved. It is these sets of tasks that are most beneficial in developing joint training guides.

Specifics

To explain what I used and didn't use, I have listed the sections which make up a Battlefield Function analysis below with a note as to the utility of each in developing a joint training guide. Caution is advised in not perceiving my comments on certain sections as negative. On the contrary, each of these sections has great value in other areas.

Introduction: Information is provided concerning the presentation of the analysis components and the context in which the analysis was developed. The information provides an overview of the analytical approach.
[Utility: Good explanation of what's in the BF. Needed to understand sections to be used, but the information itself was not used in training guide development.]

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<u>Purpose and Outcomes of BF</u>: The overall end result which the BF is supposed to accomplish, termed the purpose, is identified. This component also identifies the end states or bottom-line results necessary to achieve the purpose, termed outcomes. As a consequence, this component of the analysis defines the end states that performance of the tasks must accomplish.
[Utility: Excellent material and used to develop overall joint training objective, task and standards.]

<u>Flow Charts by Phase (Planning, Employment, Transition)</u>: This graphical description portrays the sequence of BF tasks within the framework of phases. This section describes the flow of tasks during each phase, the vertical task linkages (to higher and lower echelon units), and horizontal linkages to other BFs for the echelon being analyzed. It also depicts information flow which affects the tasks.
[Utility: Somewhat complicated and difficult to decipher, but contains good information on inputs and outputs among various headquarters; however, these are arranged at an overall headquarters staff level and are not broken out into key staff sections within that headquarters.]

<u>Other BFs Which Interact with BF 15</u>: Tasks performed in other BFs or by other units are described as they relate (i.e., are linked) to the tasks of BF 15. These descriptions provide verbal details of the relationships portrayed graphically by the Flow Charts. The purpose of this section is to allow the user to incorporate related tasks and participants into a training exercise for this BF. Tasks which link to this analysis have been extracted for BFs or units for which functional analyses have been accomplished and extrapolated for those which have not yet been developed.
[Utility: Not used.]

<u>Key Participants by Task</u>: The participants required to perform the tasks are identified. Identification is based on the appropriate echelon/type unit TO&E, and includes special staff members who are critical for task accomplishment.
[Utility: Lists of participants are shown next to each of 24 very generalized tasks. Example: "Task - JTF plan is modified and refined. Key Participants - CJTF, JTF Deputy Cmdr, C/S, J1, J2, J3, J4, J5, J6, JFFC (and 16 others)." Not of much use in determining who does what detailed tasks in order to modify and refine the plan. Not used.]

<u>Key Inputs and Outputs to BF</u>: The critical information required and generated by participants to successfully accomplish the BF is identified. Where information results from the performance of the BF tasks, BF information output is identified. One BF's information output normally is provided as another BF's input. Critical input and output are organized by the specific part of the doctrinal product or

means used to communicate it. The source of critical information is specific only to the BF echelon and function being analyzed, and is not intended to reflect all the information the product may contain. The linkages of inputs and outputs to specific tasks are depicted in the Flow Charts by Phase component.
[Utility: Only provides inputs and outputs from one major headquarters to another, not among the key staff sections within the headquarters to be trained. Of marginal use.]

Task List Summary: The tasks which are required to achieve the purpose of the BF are listed and organized by phase.
[Utility: A listing of the 24 very generalized tasks. Provides a logical sequence of topic headings for the descriptions of responsibilities and tasks for each of the key staff sections in a joint training guide.]

Task List: Tasks and supporting tasks necessary to perform the function are listed by phase. Normally, the task identifies the primary participants responsible for performing the tasks. The tasks have been extrapolated from joint publications or derived from experiences with joint operations. The specific sources or references for each task and sub-task are shown in brackets [ ] following the task.
[Utility: For training guide development, this is the "meat" of the BF. Used almost every word.]

Task Linkages of BF to UJTL: Links the tasks performed in this analysis with tasks identified in the UJTL. The purpose is to assist the trainer or training developer in incorporating appropriate joint tasks and participants into a training exercise for this BF.
[Utility: May be important for convincing joint exercise planners of utility in using training guide for their exercises, but not used in developing the guide.]

Task Linkages of BF to Army FM and ARTEP MTPs: Linkages to Army documents are included to aid corps commanders in development of training programs. Specific references to appropriate Army training and evaluation plan-mission training plans (ARTEP-MTPs), echelon and functional area field manuals (FMs), and proponent school special texts are shown in brackets for each task in the task list.
[Utility: May be important for convincing Army exercise planners of utility in using training guide for their exercises, but not used in developing the guide.]

Assessment Package: A series of measures of effectiveness and performance measures are provided so that BF performance can be assessed from various perspectives and levels of detail. These measures are described with a brief rationale for their development and use.
[Utility: Of great use in producing self-assessment tools for conducting a

headquarters AAR on the overall training objective task and standards, but not useful in developing detailed self-assessment tools for each of the key staff sections involved.]

References: The sources of information from which this BF function analysis is derived are listed. The source's title and publication date are provided for users to locate the doctrinal source material for further detail and context.
[Utility: Good start for developing training guide reference section, but other references are needed to support detailed staff section tasks and self-assessment tools.]

How to Produce Training Guides from Battlefield Functions: Methodology

As alluded to in what has been written so far, the key to using BFs to develop training guides is to determine who the training audience is and then to extract the detailed information required for that audience. The BF displays information for the unit headquarters as a whole. However, in training a headquarters staff, each key staff section involved in the battlefield function must be identified, and each of their responsibilities and tasks needs to be derived from the BF Task List.

This is not a simple endeavor. To identify which staff sections are critical to the function being trained, and then to determine which tasks in the BF Task List are performed by each of them, requires careful analysis by experienced subject matter experts (SMEs). Once they have completed this analysis, they produce a detailed and comprehensive set of responsibilities and tasks, displayed in logical combat operational sequence for each of the key staff sections. As this is being accomplished, requirements for additional information, useful to the staff sections' training but not found in the BF, will undoubtedly arise. The SMEs will consult doctrinal publications, unit SOPs, and training guides/manuals, and produce the additional resources needed by those key staff sections.

In the "Joint Fires Training Guide for a Corps JTF," it was determined that the key JTF staff elements involved are: the J3 Plans Section, the J3 Ops Section, the J2 Staff Section, and the Joint Force Fires Coordination Element (JFFC-E). Detailed responsibilities and tasks for each of the key staff sections were produced as Appendices A-D (J3 Plans - A, J3 Ops - B, J2 - C, JFFC-E - D). The need for additional resources for use by the key JTF staff sections involved in joint fires operations while training or in actual combat was also determined. They can be found in the appendices shown below.

Appendix F - Deep Operations Coordination Cell Description and Functions
Appendix G - Battlefield Coordination Detachment Description and Functions
Appendix H - Joint Targeting Coordination Board Description and Functions

The next step is to develop the overall training objective, task and standards. This may seem like it should be the first step; but without a comprehensive and detailed analysis of which staff sections are to be trained and what tasks they are to be trained in, the overall training objective, task and standards would remain somewhat vague. After producing the sets of responsibilities and tasks for the staff sections, the SMEs can narrow their thoughts into what the critical overall task should be with detailed, corresponding standards. The Purposes and Outcomes section of the BF provides the start point for this refinement process. For the "Joint Fires Training Guide for a Corps JTF," the "outcomes" portion of BF 15 Purposes and Outcomes was modified and turned into the training objective standards.

Once the overall training objective, task and standards have been developed, the SMEs use the same process to refine the Assessment Package section of the BF, resulting in the Self-Assessment Tools to be used in conducting the AAR covering how well the unit performed the overall function. In the "Joint Fires Training Guide for a Corps JTF," the Self-Assessment Tools for Overall JTF Joint Fires AAR (Appendix E) are only slightly modified from what was in the BF 15 Assessment Package.

The final step is to develop self-assessment tools to be used by the chief of each key staff section to conduct a 10-15 minute mini-AAR (after action review) for his section at the conclusion of each iteration or phase of its operations. This allows him to give and receive feedback on how well the process was performed and on what needs to be fixed or improved for the next iteration. The Self-Assessment Tools:

- Provide a reminder and a format to conduct on-going, semi-structured reviews of what's being done, for what purpose, and how well it's being done.
- Provide a record of performance progress throughout the duration of a training exercise or during actual combat.
- Provide a record of lessons learned for inclusion into the overall AAR of the function.
- Identify tasks which require additional training or need added emphasis in future training exercises.

Many of the tasks performed by key staff sections at higher level staffs are process oriented, as opposed to outcome oriented. To perform the processes involves, to a large degree, the performance of military "art" based on collective judgment. This is something difficult to measure *objectively*. It is, therefore, necessary to derive mainly *subjective* performance measurement tools. The SMEs design these performance

measures and metrics to cause the staff personnel, during their mini-AARs, to consider if and how they performed each of the detailed tasks contained in their set of responsibilities and tasks. In the "Joint Fires Training Guide for a Corps JTF," the self-assessment tools are in the form of questions to be considered at the completion of each iteration or phase of operations. They are located immediately following each set of responsibilities and tasks in Appendices A-D.

Conclusion

This report describes a methodology for developing a joint training guide with training objectives and performance measurement tools based on a completed Battlefield Function. The accompanying "Joint Fires Training Guide for a Corps JTF" was developed based on BF 15 using that methodology. However, it has, as yet, not been "blooded," that is to say no corps JTF has used it to train joint fires operations. This should be done as soon as possible in order to assess its training effectiveness and to gather user comments and recommendations on what's needed to improve it.

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